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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,289	12/03/2003	Armin R. Volkel	D/A3237 XERZ 2 00607	6700

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EXAMINER
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FICK, ANTHONY D

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 08/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/727,289	VOLKEL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Anthony Fick	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8 and 10-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,4-7 and 15-19 is/are allowed.
- 6) ☒ Claim(s) 8 and 10-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over McBride et al. (U.S. 6,296,752) in view of Benecke et al. (U.S. 6,149,789).

McBride discloses an apparatus for separating molecules. The apparatus has electrodes for a traveling wave protocol (column 5, paragraph 4) on a substrate containing a two-dimensional array of electrodes (column 5, paragraph 2), the electrodes can be individually controlled by an electronic switching device (column 5, paragraph 3), and the traveling wave protocol can be produced by a multiphase signal as shown in figure 10. Each electrode can be individually controlled thus a plurality of electrical contacts between the electrodes and the voltage controller must be present in the device of McBride. McBride further discloses the array can contain any number of shapes (column 5, paragraph 2). McBride also discloses in figure 9 a planar conductor providing a voltage potential with respect to the grid that provides a bias field.

The difference between McBride and claims 8 and 10 is McBride does not show a grid arranged in concentric circles.

Benecke teaches a device for manipulating particles utilizing traveling waves. Benecke teaches several arrangements of electrodes including a variety of concentric circle arrangements in figures 8, 9, and 10.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the concentric circle arrangement of Benecke for the point electrode grid of McBride because the arrangement allows centering and decentering of particles and is especially suited to work with living biological cells (Benecke column 7, paragraph 5). Also the configuration of the electrode grid depends on the specific application of the device and it would be obvious to one skilled in the art to choose a specific one, concentric circle arrangement, for a specific application. Because McBride and Benecke are both concerned with manipulating particles using traveling waves, one would have a reasonable expectation of success from the combination. Thus the combination meets claims 8 and 10.

3. Claims 11 through 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over McBride et al. (U.S. 6,296,752).

McBride discloses an apparatus for separating molecules. The apparatus has electrodes for a traveling wave protocol (column 5, paragraph 4) on a substrate containing a two-dimensional array of electrodes (column 5, paragraph 2), the electrodes can be individually controlled by an electronic switching device (column 5, paragraph 3), and the traveling wave protocol can be produced by a multiphase signal as shown in figure 10. Each electrode can be individually controlled thus a plurality of electrical contacts between the electrodes and the voltage controller must be present in

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the device of McBride. McBride further discloses separation of particles in the system by providing a fluid medium on top of the grid, then applying a control signal to the electrodes to separate the particles as shown in figure 7. McBride also discloses the separations can be carried out using distinct protocols in each separate direction (column 5, paragraph 2). Figure 7 shows the traveling waves pushing the molecule in the rows and the columns at the same time, however the arrows within the figure are only illustrative possible paths of molecules A and B. The molecules can arrive at the same endpoints in the grid by traveling across the rows and then down the columns, just the same as traveling diagonally.

McBride further discloses a two dimensional separation technique utilizing a protocol in the first direction to separate the particles, and then further using a protocol in the second direction to further separate the particles (column 4, paragraph 3). In this technique, the traveling waves would be sent in one dimension to collect the agent on the one side of the grid before the signal would be sent through the other dimension to further concentrate the sample.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to operate the electrode array grid of McBride by moving the particles first in the horizontal direction (applying control signal to the rows) and then in the vertical direction (applying control signal to the columns) because this method allows the conduction of two-dimensional separations using distinct protocols in each separation direction (column 5, paragraph 2) and mimics the typical two-dimensional electrophoresis utilized within the art and disclosed by McBride to promote separation of

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the species (column 4, paragraph 3). Operation of the grid in this manner also lengthens the particle path for a species, thus enhancing the separation by subjecting the particle to the separation waves for a longer length of time.

McBride discloses the separation is enhanced utilizing the two dimensions similar to the enhancement seen in 2D gel electrophoresis, thus the concentration of the agent after the second dimension separation occurs is greater than the concentration of the agent after the first dimension separation as in claim 13. Also the first dimension separation still produces a higher concentration than the original as the movement in the first direction enhances the separation of the agent as in claim 14.

***Allowable Subject Matter***

4. Claims 1 through 2, 4 through 7 and 15 through 19 are allowed.

***Response to Arguments***

5. Applicant's arguments filed June 5 2006 have been fully considered but they are not persuasive. Applicant argues on pages 8, 9 and 10 of remarks, that the combination of McBride in view of Benecke does not meet the claims as a practitioner in the field would be motivated to design an orthogonal electrode point grid from the teachings of McBride or a ring shaped electrode from the teachings of Benecke. Applicant further argues there is no motivation in either patent to selectively use features of each patent. The examiner respectfully disagrees. As stated above, McBride discloses the array can contain any number of shapes (column 5, paragraph 2) so choice of a specific shape or configuration is a design choice. Further the teachings of Benecke display individual arc shaped electrodes placed in a pattern resembling

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concentric circles within figure 8. Benecke also gives motivation for using this configuration with electrodes; the arrangement allows centering and decentering of particles and is especially suited to work with living biological cells (Benecke column 7, paragraph 5). As McBride allows for other shapes, with figures 6A and 6B as two possible configurations, and Benecke provides motivation for choosing the concentric circle configuration, the combination of the two does meet the requirements of the claims and the rejections are maintained.

Applicant further argues against the rejections of claims 11 through 14. Applicant argues the patent of McBride would lead a practitioner in the art to utilize a system of linear electrodes and the point electrodes embodiment teaches away from the methodology of the claims. The examiner respectfully disagrees. McBride discloses the embodiment of the electrode-carrying plate, point electrode grids, can also be used to conduct two-dimensional separations using distinct protocols in each separate direction (column 5, lines 34-37). Several paragraphs earlier, McBride discloses a method of two-dimensional separation using distinct protocols in each direction (column 4, paragraph 3). In this technique, the traveling waves would be sent in one dimension to collect the agent on the one side of the grid before the signal would be sent through the other dimension to further concentrate the sample. Thus McBride discloses using two-dimensional separation with the point electrodes as well as providing a two-dimensional separation method and it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize McBride's separation method

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as the two-dimensional separation in the point electrode grid. Therefore the rejection is maintained.

***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 7 AM to 4 PM.

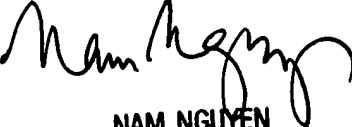
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick *ADF*  
AU 1753  
August 18, 2006

  
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SUPERVISORY PATENT EXAMINER  
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